

CLAIMS

1. A handheld circuit tester for automotive electrical systems having at least one of a low voltage and a high voltage, the tester comprising:

an elongated, curved handle portion, the handle portion being substantially in the shape of a screwdriver handle;

a probe device, the probe device being substantially in the shape of a screwdriver shank, wherein the probe device is capable of conducting current from the positive side of an automotive circuit;

a ground device capable of securedly attaching to the negative side of the automotive circuit; and

electronic circuitry operatively coupled to the probe device and the ground device, the circuitry being configured to sense a low automotive system voltage and a high automotive system voltage, and wherein the electronic circuitry is disposed within the elongated, curved handle portion.

2. The tester as recited in Claim 1, wherein the electronic circuitry includes a first visible indicator that indicates a low automotive system voltage is sensed, and a second visible indicator that indicates a high automotive system voltage is sensed.

3. The tester as recited in Claim 2, wherein the first and second visible indicators are light emitting devices.

4. The tester as recited in Claim 3, wherein the handle portion is composed of a material that is sufficiently transparent such that the light emitting devices are visible through the material when the light emitting devices are energized.

5. The tester as recited in Claim 4, wherein the handle material is a polymer.

6. The tester as recited in Claim 3, wherein the first visible indicator emits light of a first color when a low automotive system voltage is sensed, and the second visible indicator emits light of a second color when a high automotive system voltage is sensed.

7. The tester as recited in Claim 3, wherein the first visible indicator is two LEDs, and the second visible indicator is two LEDs.

8. The tester as recited in Claim 1, further comprising:

a spring assembly disposed within the handle between the probe device and electronic circuit, wherein the spring assembly is comprised of a conductive material, and wherein the spring assembly is configured to compress when force is applied to the probe device.

9. The tester as recited in Claim 1, wherein the ground device includes insulation positioned thereon, and

wherein the probe device includes protective layer positioned thereon, the tubing being configured to securely fit over an exposed portion of the probe device.

10. The tester as recited in Claim 1, further comprising:

a retractable assembly that includes an insulated flexible electrical wire, the retractable assembly being disposed between the spring assembly and the ground device.

11. The tester as recited in Claim 1, further comprising:

a protective cap having an open end capable of securely fitting over at least a portion of the probe device, whereby the protective cap protects the probe device from physical damage when the probe device is not in use; and

a strain relief device extending from the handle, the strain relief device being coaxial with the handle and the retractable assembly, wherein the retractable assembly has an

outside diameter and the strain relief device has an inside diameter, wherein inside diameter of the strain relief device forms a substantially annular ring around at least a portion of the outside diameter of the retractable assembly.

12. The tester as recited in Claim 1, wherein the electronic circuitry includes a first zener diode having a breakdown voltage sufficient to energize only the first visible indicator when a low automotive system voltage is sensed, the electronic circuitry further including a second zener diode having a breakdown voltage sufficient to energize the second visible indicator when a high automotive system voltage is sensed.

13. A method for testing the voltage level of an automotive circuit with a circuit tester, the automotive circuit having one of a high voltage and a low voltage, the circuit tester including an elongated curved handle portion, a probe device substantially in the shape of a screwdriver shank, a ground device, and electronic circuitry operatively coupled to the probe device and the ground device, the electronic circuitry being disposed within the handle portion, wherein the circuitry is configured to sense a low voltage and a high voltage of an automotive circuit, and wherein the circuit tester further includes a visible display operatively coupled to electronic circuitry, the handle being composed of a material that is sufficiently transparent such that the visible display is visible through the handle, the method comprising the steps of:

- connecting the probe device to the positive side of an automotive circuit;
- connecting the ground device to the negative side of the automotive circuit; and
- determining the voltage level of the automotive circuit based on the visible display.

14. The method as recited in Claim 13, wherein the visible display includes a first visible indicator and second visible indicator, wherein the first visible indicator indicates a low automotive system voltage is sensed, and the second visible indicator indicates a high automotive system voltage is sensed.

15. The method as recited in Claim 14, wherein the first visible indicator includes an LED that emits light of a first color when a low automotive system voltage is sensed, and the second visible indicator includes an LED that emits light of a second color when a high automotive system voltage is sensed.

16. An electrical circuit for testing the voltage level of an automotive circuit, the electrical circuit being adapted to be disposed within a curved, elongated handle of a circuit tester for automotive electrical circuits, the handle being composed of a material that is sufficiently transparent such that light from a first light emitting load and light from a second light emitting load are visible through the handle, the circuit comprising:

a first voltage sensing device that senses a low automotive system voltage;

a second voltage sensing device that senses a high automotive system voltage;

wherein the first light emitting load is responsive to the first voltage sensing device, and wherein the first voltage sensing device energizes the first light emitting load when a low automotive system voltage is sensed; and

wherein the second light emitting load is responsive to the second voltage sensing device, and wherein the second voltage sensing device energizes the second light emitting load when a high automotive system voltage is sensed.

17. The circuit as recited in Claim 16, wherein the first light emitting load is a set of series-connected LEDs, and the second light emitting load is a set of series-connected LEDs.

18. The circuit as recited in Claim 16, wherein the first set of series-connected LEDs is configured to respond to the first voltage sensing device by emitting light of a first color when a low automotive system voltage is sensed by the first voltage sensing device, and the second set of series-connected LEDs is configured to respond to the second voltage sensing device by emitting light of a second color when a high automotive system voltage is sensed by the second voltage sensing device.

19. The circuit of Claim 16 wherein the first voltage sensing device is a zener diode, and the second voltage sensing device is a zener diode.

20. An electrical circuit for testing the voltage level of an automotive circuit, the circuit comprising:

a first zener diode configured to energize a first visible indicator;

a second zener diode configured to energize a second visible indicator;

wherein the first visible indicator is responsive to the first zener diode such that the first visible indicator provides a visible indication that a low automotive system voltage is sensed, and wherein the first zener diode has a breakdown voltage sufficient to energize only the first visible indicator when a low automotive system voltage is sensed; and

wherein the second visible indicator is responsive to the second zener diode such that the second visible indicator provides a visible indication that a high automotive system voltage is sensed, and wherein the second zener diode has a breakdown voltage sufficient to energize the second visible indicator when a high automotive system voltage is sensed.

21. An apparatus for testing the voltage level of an automotive circuit having at least one of a low voltage or a high voltage, the apparatus comprising:

means for sensing a low automotive system voltage;

means for providing a first visible indicator when a low automotive system voltage is sensed;

means for sensing a high automotive system voltage; and

means for providing a second visible indicator when a high automotive system voltage is sensed.